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MAY 18.

The President, Dr. **Ruschenberger**, in the chair.

Twenty-seven members present.

On the Antelope-Deer of the Santa Fe Marls.—Prof. **Cope** exhibited specimens of the dentition, horns, etc., of the antelope-deer found by the paleontologist of the Wheeler survey of New Mexico. He coincided with Prof. Gervais' view that the oldest name for the genus is *Dicrocerus*, Lartet, of which the *D. dichotomus* of the French Miocene is type. The American species are *D. necatus*, Leidy (*Merycodus*, Leidy; *Cervus warrenii*, Leidy); *D. furcatus*, Leidy; (*Antilope* and *Cosoryx*, Leidy); *D. ramosus*, Cope; *D. gemmifer*, Cope (*Merycodus*, Cope); and *D. teres*, Cope. The specimens proved that some specimens of a species exhibit the horns continuous with the frontal bones, while others of the same had been broken off and anchylosed, with the production of a small burr.

He added that the facies of the fauna of this horizon throughout the west, including, as it does, *Amphicyon*, *Dicrocerus*, *Hippotherium*, *Aceratherium*, *Mastodon* allied to *M. angustidens*, etc. etc., more nearly resembles the upper Miocene of Europe than the Pliocene of that continent.

MAY 25.

The President, Dr. **Ruschenberger**, in the chair.

Nineteen members present.

Charles Sumner Williamson, Dr. John M. M'Grath, J. Warner Edwards, F. Oden Horstman, William Williamson, M. B., Wm. G. Platt, Miss Mary Jeanes, and Miss Anna T. Jeanes were elected members.

Dr. John Belisario of Sydney, N. S. W., was elected a correspondent.

JUNE 1.

The President, Dr. **Ruschenberger**, in the chair.

Twenty-one members present.

A paper entitled "A Critical Review of the North American Saccomyidæ," by Elliott Coues, U. S. A., was offered for publication.

On some new fossil Ungulata.—Prof. COPE exhibited specimens of the following ungulates, found by himself in New Mexico, while acting as geologist to the United States Survey under Lieut. G. M. Wheeler, U. S. E.

PLIAUCHENIA HUMPHRESIANA, Cope, gen. et sp. nov.

Char. gen. Represented in the collection of the expedition by a left mandibular ramus which includes alveolæ of all the teeth, and greater or less portions of all the molars except the last, and the first premolar. In the specimen the dental formula is I.? C. 1; P.m. 3; M. 4; or one premolar less than in *Procamelus*, and two more than in *Auchenia*. On this ground the present animal is regarded as representing a new genus of *Camelidæ*, intermediate between the genera named. A portion of the left maxillary bone of a larger species is thought to belong to the same genus, although it presents the number of premolars found in *Procamelus*, viz., four. The first and second are, however, very close together, so as to leave about the same relative interval between the first and third as is seen in the *P. humphresiana*, should the second premolar be omitted. The latter tooth is wanting from the lower jaw of the *P. humphresiana*. The difference in dental formula between the superior and inferior dental series admitted provisionally in *Pliauchenia*, finds justification in the formula of the llamas (*Auchenia*), where the premolars are $\frac{2}{1}$.

Char. specif. The animal now described is of about the size of the *Procamelus occidentalis*, or somewhat larger than any of the existing llamas. The mandible is stout and deep, contracting rapidly forwards. The canine and first premolar are especially stout, and separated by a very short diastema; that separating the first and third premolars is also short, being less than that which separates the first and second in *Procamelus occidentalis;* could it be supposed that the second premolar is abnormally absent from the *P. humphresiana*, the diastema would be reduced to a very small compass. Without this supposition the diastemata, both before and behind the first premolar, are shorter than in any of the *Procameli*, as *P. robustus*, *P. angustidens*, *P. heterodontus*, and *P. gracilis*. The mental foramen issues below the anterior border of the first or caniniform premolar, and the anterior border of the latter marks the posterior margin of the symphyseal suture. The third premolar is nearly as long as, but narrower than the fourth, and the true molars increase rapidly in size posteriorly.

Measurements.	M.
Length of dental series from front of canine to front of last molar	.125
Length from canine to P. m. No. 1	.010
Long diameter of first premolar	.010
Diastema to third premolar	.023
Length of third premolar	.011
" " first true molar	.019
Width of crown of first true molar	.011
Length of crown of second true molar	.025

This species is dedicated to General A. A. Humphreys, Chief of the Topographical Engineers, in recognition of the enlightened interest in all departments of scientific investigation, exhibited in his long and able administration.

PLIAUCHENIA VULCANORUM, Cope, sp. nov.

Represented by the left maxillary bone of a camel of about the size of the existing dromedary, and considerably larger than the species last described. The dental formula is, molars 4—3. The first premolar is only removed from the second by a diastema equal to the long diameter of the latter. The latter has no inner cingulum, while in the third it is so strong as to constitute an internal crescent. The third is much larger, and exhibits the usual single external and single internal crescents. The first molar is stout, long rooted, and furnished with a strong ridge on the outer side, bounding the posterior crescent-bearing column in front. There is a weak ridge on the middle of the anterior column, and only a rudiment on the last premolar. There are no cingula on either the inner or outer bases of the crown. The enamel is nearly smooth. A palato-maxillary foramen issues opposite the anterior border of the base of the third premolar.

Measurements.	M.
Length from posterior border of first premolar to posterior border of first molar	.090
Length of first true molar	.030
Width of basis of crown of first true molar	.024
Length of fourth premolar	.019
Width of base of crown of fourth premolar	.018
" " palate at first true molar	.040

The typical specimen was found near Pojuaque, a village of the Pueblo Indians. Various bones of camels of the size of the *P. vulcanorum* were also found, some of which doubtless belong to it.

HIPPOTHERIUM CALAMARIUM, Cope, sp. nov.

This three-toed horse is indicated by the oral and palatine parts of the skull with the superior dental series of both sides, together with one mandibular ramus with all its teeth, of an individual from near San Ildefonso; and also probably by molar teeth of two individuals from the Loup Fork beds of Colorado. The species is allied to the *H. paniense*, Cope, and differs from the *H. occidentale*, *H. speciosum*, and *H. gratum* of Leidy, in the relative form and size of the interior dentinal column. In the two species first named, this column is subcylindric and equal to or smaller than the posterior internal columnar fold; in the three species last named the anterior column is flattened or oval in section, and often larger than the posterior columnar fold, and submedian in position.

In the typical or New Mexican specimen the interior column is large, and its centre is anterior to the middle transverse line of the crown. In the present state of attrition, which has left two-thirds of the crowns of the median molars, this column presents an angular projection towards the inner anterior crescent, betraying an approach to the union seen in *Protohippus*, which is in the fifth molar of the right side of the present horse, actually accomplished through the medium of a narrow isthmus. The dentinal band, connecting the inner crescents, throws out two, rarely one, fold towards this column. The borders of the lakes are much plicate, the posterior border of the anterior lake having from four to six inflections. The posterior border of the posterior lake exhibits one deep inflection, which is generally bifurcate.

The first premolar is quite small, and is two-rooted; the second is a wide tooth, different in form from the elongate corresponding tooth of the *H. occidentale*, its anterior lobe being but little prominent. The palate is wide and well arched. The mandibular teeth are elongate, but not narrow, and the interior lobes are well developed, especially the median ones. No basal cingula on teeth of either jaw. The last molar is smaller than the three preceding it, and the anterior lobe of the first is quite narrow.

The molars of one of the specimens from Colorado are closely similar in all respects, except that the anterior lobe of the second premolar is a little more produced. I also refer here the tooth described as "No. 2," under *H. paniense*, in Report U. S. Geol. Survey, Terrs. 1873, p. 522–3. As compared with the molars of that species those of *H. calamarium* differ in the much greater complexity of the enamel folds, those of the *H. paniense* being the simplest in the genus, even more so than in *H. affine*. The anterior inner column of *H. paniense* lacks the characteristic inner angle seen in the present horse.

Measurements.	M.
Length of seven superior molars	.134
" " three true molars	.062
" " second premolar	.026
Width of crown of second premolar	.020
Greatest length of second premolar	.022
" width " " "	.024
" length " penultimate molar	.022
" width " " "	.022
Width of palate (chord) between middle of third premolars	.042
Length crown antepenultimate lower molar	.021
Width " " " "	.012

The typical specimen belongs to an adult animal, and was taken from the matrix by myself without admixture of others.

APHELOPS JEMEZANUS, Cope, sp. nov.

That a second species of rhinoceros, even larger than the other species of *Aphelops*, formerly existed in the region of New Mexico, is demonstrated by a right mandibular ramus obtained by Dr. H. C. Yarrow, from near the town of Santa Clara, on the west side of the Rio Grande. The specimen in its present condition includes the condyle, angle, and ramus as far as the last premolar, and supports the three true molars. The latter are worn, indicating the full age of the animal. They still retain the enamel surface of the sinus between the posterior and median transverse crests, and the lower end of the sharp inner margin of the anterior transverse crest.

While the ramus exhibits the compressed form seen in *A. megalodus* and *A. meridianus*, it differs from these and the *A. crassus* in many striking respects. Thus the inferior margin near the angle does not exhibit the protuberance and following contradiction of the inner side seen in the first two species. In another feature it differs from all the other species, *i. e.*, in the form of the ascending ramus. This rises very gradually from the basis of the last molar, leaving a subhorizontal edentulous space behind the latter as long as the second true molar. Its anterior face, instead of being flat and bounded by strong, lateral, angular ridges, as is the case in *A. crassus* and the two other species, is rather narrowly convex. Instead of the usual ridge of the outer side, the anterior border of the area of insertion of the masseter muscle is marked by a permanent curved protuberant margin, which is wanting in the three other species, the surface in them being plane. Behind the condyle is seen the tuberosity characteristic of the Rhinoceridæ. The internal pterygoid fossa is well marked. Rugosities for insertion on the lower border of the angle are strong.

The relations of the dentition of this species are also peculiar. The last molar is nearly half as large again as that of specimens of *A. megalodus*, and *A. meridianus* of similar dimensions of ramus, and the teeth diminish in length anteriorly more rapidly than in width. Thus, while the first true molar is as long as in the two species named, the width is between one-half and one-third greater. There are no external basal cingula.

Measurements.	M.
Length of ramus from fourth premolar (behind) to middle of masseteric fossa	.240
Length of series of true molars	.148
" " first true molar	.044
Width " " " "	.033
Length " third " "	.058
Width " " " "	.035
Diameter of ramus at first molar	.080
Depth of ramus of third "	.092

The Phylogeny of the Camels.—Prof. Cope made the following remarks on the extinct genera of camels :—

The line of descent of the horses has been already largely traced by several paleontologists ; another series may now be regarded as partially completed, viz., that of the camels. I have already indicated the antecedent relation in which the miocene genus *Poëbrotherium* stands to the existing camels in the structure of the limbs and teeth, as well as the intermediate position occupied by *Procamelus* in the existence of the incisor teeth. It now remains to point out the relations determined by the structure of the feet in *Procamelus* and the dentition in *Pliauchenia*, a new genus discovered in the Loup Fork beds of New Mexico. Commencing with the earliest genus, *Poëbrotherium*, we have the molar teeth 4—3, as in the primitive mammalia generally. There are but two elongated metacarpals, which are not united into a cannon bone, the lateral ones being rudimental, while the carpals are of the number characteristic of the mammalia of all the orders with numerous toes, namely, seven. In *Procamelus* of the succeeding formation, the molar formula continues to be 4—3, but the posterior teeth are more prismatic in form than in the miocene genus. The incisor teeth are present, thus displaying the primitive character of the class generally; though as these teeth are early shed, an approximation to the edentulous condition of existing ruminants in this part of the mouth is apparent. In the feet, the approximation to the existing *Camelidæ* is greater than in the dentition. Thus the lateral rudimental metacarpals of *Poëbrotherium* have disappeared, and with them the trapezoides of the carpus. The magnum remains distinct, while the middle metacarpals are united at full age into a cannon bone. In the contemporary genus *Pliauchenia*, a further modification of dentition is observed. As above stated, the molars of *Procamelus* number $\frac{4}{4}$—$\frac{3}{3}$; in *Camelus* they number $\frac{3}{2}$—$\frac{3}{3}$; in *Pliauchenia* we have the intermediate condition $^{?}\frac{4}{3}$—$\frac{3}{3}$. The end of the series is seen in *Anchenia*, where the formula is $\frac{2}{1}$—$\frac{3}{3}$.

It has been observed as a remarkable fact, that North America should present us with the most complete history of the succession of genera which resulted in the horse, and yet should have received this animal by importation from Europe. Nevertheless the more prominent genera of this series have been obtained in the European formations; especially *Anchitherium* and *Hippotherium*. But as regards the *Camelidæ*, the genera above described are exclusively North American; no well-determined form of this group having been found in any formation of the Palæarctic region up to the present time. Until such are discovered, there will be much ground for supposing that the camels of the old world were derived from American ancestors; while the presence of the llamas in the existing South American fauna, indicates the absence there of the conditions which caused their extermination from North America.

Living Organisms in the Pulp Cavity of Teeth.—Mr. C. N. Peirce remarked that, in making some investigations on the organisms found within the oral cavity, he noticed what might be deemed of some importance to those interested in studying the "Beginnings of Life." It is not an infrequent occurrence for the pulp, or nerve and accompanying vessels, within the tooth to become devitalized without any loss of the hard tissues from dental caries or otherwise. The loss of vitality and necessary disintegration of this peculiarly vascular tissue, results invariable in the formation of pus and gas.

Upon opening into several such cavities they were, as is usual, found to be extremely offensive from this degenerated matter. On examining this putrid material with the microscope, living organisms, resembling what have been described and figured as *Bacteria* and *Vibrios*, were observed in large numbers. Their presence in these cavities, secluded as they were from any contact with the atmospheric air or secretions of the mouth, must be accounted for in one of two ways, viz.: The embryonic germs of these organisms must be universally disseminated, not only throughout this vascular tissue, but also the various textures of the body, by means of the circulating fluid, there to develop and manifest themselves whenever these higher tissues are on the eve of death and degeneration—or else it must be that when the vitality of this vascular tissue is on the wane, its constituent particles are capable of individualizing themselves and of growing into the low organisms in question.

JUNE 8.

The President, Dr. **RUSCHENBERGER**, in the chair.

Twenty-five members present.

On Samarskite.—**JOSEPH WILLCOX** called attention to a mineral specimen (samarskite) presented by him, which was found at a locality discovered by him recently among the mountains in Mitchel Co., North Carolina. Excepting in North Carolina, this rare mineral is only found in the Ural Mountains in Asia. According to Dana's Mineralogy, the largest specimens found at the latter locality are only as large as hazel-nuts; but Mr. Willcox said he obtained a specimen in North Carolina that weighs more than twenty pounds. It was associated with decomposed feldspar.

The Geology of New Mexico.—Prof. **COPE** stated that the ground covered by the geological investigation conducted mainly in New Mexico during 1874 in connection with the Wheeler U. S. topographical and geological survey, embraces the eastern slope of the Rocky Mountains from Pueblo to the Sangre de Christo Pass; both sides of the Rio Grande Valley from that point to Algodones, N. M.; the western or Sierra Madre range, and the country for